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What's So Funny? The Science of Why We Laugh

Psychologists, neuroscientists and philosophers are trying to understand humor

- By [Giovanni Sabato](#)

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IN BRIEF

Researchers do not fully understand which aspects of a joke or situation make it seem funny.

Various theories have posited that people find amusement in the misfortunes of others, in expressions of otherwise forbidden emotions, in juxtaposition of incompatible concepts and in realizing that certain expectations have been violated.

One scheme weaves several hypotheses together: it holds that humor results when a person simultaneously recognizes both that a norm has been breached and that the breach is benign.

Laughter may have evolved as a way to enhance connectedness in societies.

“How Many Psychologists Does It Take ... to Explain a Joke?”

Many, it turns out. As psychologist Christian Jarrett noted in a 2013 article featuring that riddle as its title, scientists still struggle to explain exactly what makes people laugh. Indeed, the concept of humor is itself elusive. Although everyone understands intuitively what humor is, and dictionaries may define it simply as “the quality of being amusing,” it is difficult to define in a way that encompasses all its aspects. It may evoke the merest smile or explosive laughter; it can be conveyed by words, images or actions and through photos, films, skits or plays; and it can take a wide range of forms,

from innocent jokes to biting sarcasm and from physical gags and slapstick to a cerebral double entendre.

Even so, progress has been made. And some of the research has come out of the lab to investigate humor in its natural habitat: everyday life.

SUPERIORITY AND RELIEF

For more than 2,000 years pundits have assumed that all forms of humor share a common ingredient. The search for this essence occupied first philosophers and then psychologists, who formalized the philosophical ideas and translated them into concepts that could be tested.

Perhaps the oldest theory of humor, which dates back to Plato and other ancient Greek philosophers, posits that people find humor in, and laugh at, earlier versions of themselves and the misfortunes of others because of feeling superior.

The 18th century gave rise to the theory of release. The best-known version, formulated later by Sigmund Freud, held that laughter allows people to let off steam or release pent-up “nervous energy.” According to Freud, this process explains why tabooed scatological and sexual themes and jokes that broach thorny social and ethnic topics can amuse us. When the punch line comes, the energy being expended to suppress inappropriate emotions, such as desire or hostility, is no longer needed and is released as laughter.

A third long-standing explanation of humor is the theory of incongruity. People laugh at the juxtaposition of incompatible concepts and at defiance of their expectations—that is, at the incongruity between expectations and reality. According to a variant of the theory known as resolution of incongruity, laughter results when a person discovers an unexpected solution to an apparent incongruity, such as when an individual grasps a double meaning in a statement and thus sees the statement in a completely new light.

BENIGN VIOLATION

These and other explanations all capture something, and yet they are insufficient. They do not provide a complete theoretical framework with a hypothesis that can be measured using well-defined parameters. They also do not explain all types of humor. None, for example, seems to fully clarify the appeal of slapstick. In 2010 in the journal *Psychological Science*, A. Peter McGraw and Caleb Warren, both then at the University of Colorado Boulder, proposed a theory they call “benign violation” to unify the previous theories and to address their limits. “It’s a very interesting idea,” says Delia Chiaro, a linguist at the University of Bologna in Italy.

McGraw and Warren’s hypothesis derives from the theory of incongruity, but it goes deeper. Humor results, they propose, when a person simultaneously recognizes both that an ethical, social or physical norm has been violated and that this violation is not very offensive, reprehensible or upsetting. Hence, someone who judges a violation as no big deal will be amused, whereas someone who finds it scandalous, disgusting or simply uninteresting will not.

Experimental findings from studies conducted by McGraw and Warren corroborate the hypothesis. Consider, for example, the story of a church that recruits the faithful by entering into a raffle for an SUV anyone who joins in the next six months. Study participants all judged the situation to be incongruous, but only nonbelievers readily laughed at it.

Levity can also partly be a product of distance from a situation—for example, in time. It has been said that humor is tragedy plus time, and McGraw, Warren and their colleagues lent support to that notion in 2012, once again in *Psychological Science*. The recollection of serious misfortunes (a car accident, for example, that had no lasting effects to keep its memory fresh) can seem more amusing the more time passes.

Geographical or emotional remoteness lends a bit of distance as well, as does viewing a situation as imaginary. In another test, volunteers were amused by macabre photos (such as a man with a finger stuck up his nose and out his eye) if the images were presented as effects created with Photoshop, but participants were less amused if told the images were authentic. Conversely, people laughed more at banal anomalies (a man with a frozen beard) if they believed them to be true. McGraw argues that there seems to be an optimal comic point where the balance is just right between how bad a thing is and how distant it is.

EVOLUTIONARY THEORY

The idea of benign violation has limitations, however: it describes triggers of laughter but does not explain, for instance, the role humor has played in humanity's evolutionary success. Several other theories, all of which contain elements of older concepts, try to explain humor from an evolutionary vantage. Gil Greengross, an anthropologist then at the University of New Mexico, noted that humor and laughter occur in every society, as well as in apes and even rats. This universality suggests an evolutionary role, although humor and laughter could conceivably be a byproduct of some other process important to survival.

In a 2005 issue of the *Quarterly Review of Biology*, evolutionary biologist David Sloan Wilson and his colleague Matthew Gervais, both then at Binghamton University, S.U.N.Y., offered an explanation of the evolutionary benefits of humor. Wilson is a major proponent of group selection, an evolutionary theory based on the idea that in social species like ours, natural selection favors characteristics that foster the survival of the group, not just of individuals

Wilson and Gervais applied the concept of group selection to two different types of human laughter. Spontaneous, emotional, impulsive and

involuntary laughter is a genuine expression of amusement and joy and is a reaction to playing and joking around; it shows up in the smiles of a child or during roughhousing or tickling. This display of amusement is called Duchenne laughter, after scholar Guillaume-Benjamin-Amand Duchenne de Boulogne, who first described it in the mid-19th century. Conversely, non-Duchenne laughter is a studied and not very emotional imitation of spontaneous laughter. People employ it as a voluntary social strategy—for example, when their smiles and laughter punctuate ordinary conversations, even when those chats are not particularly funny.

Facial expressions and the neural pathways that control them differ between the two kinds of laughter, the authors say. Duchenne laughter arises in the brain stem and the limbic system (responsible for emotions), whereas non-Duchenne laughter is controlled by the voluntary premotor areas (thought to participate in planning movements) of the frontal cortex. The neural mechanisms are so distinct that just one pathway or the other is affected in some forms of facial paralysis. According to Wilson and Gervais, the two forms of laughter, and the neural mechanisms behind them, evolved at different times. Spontaneous laughter has its roots in the games of early primates and in fact has features in common with animal vocalizations. Controlled laughter may have evolved later, with the development of casual conversation, denigration and derision in social interactions.

Ultimately, the authors suggest, primate laughter was gradually co-opted and elaborated through human biological and cultural evolution in several stages. Between four and two million years ago Duchenne laughter became a medium of emotional contagion, a social glue, in long-extinct human ancestors; it promoted interactions among members of a group in periods of safety and satiation. Laughter by group members in response to what Wilson and Gervais call protohumor—nonserious violations of social norms—was a reliable indicator of such relaxed, safe times and paved the way to playful emotions.

When later ancestors acquired more sophisticated cognitive and social skills, Duchenne laughter and protohumor became the basis for humor in all its most complex facets and for new functions. Now non-Duchenne laughter, along with its dark side, appeared: strategic, calculated, and even derisory and aggressive.

Over the years additional theories have proposed different explanations for humor's role in evolution, suggesting that humor and laughter could play a part in the selection of sexual partners and the damping of aggression and conflict.

SPOT THE MISTAKE

One of the more recent proposals appears in a 2011 book dedicated to an evolutionary explanation of humor, *Inside Jokes: Using Humor to Reverse-Engineer the Mind* (MIT Press, 2011), by Matthew M. Hurley of Indiana University Bloomington, Daniel C. Dennett (a prominent philosopher at Tufts University) and Reginal Adams, Jr., of Pennsylvania State University. The book grew out of ideas proposed by Hurley.

Hurley was interested, he wrote on his website, in a contradiction. "Humor is related to some kind of mistake. Every pun, joke and comic incident seemed to contain a fool of some sort—the 'butt' of the joke," he explained. And the typical response is enjoyment of the idiocy—which "makes sense when it is your enemy or your competition that is somehow failing but not when it is yourself or your loved ones." This observation led him to ask, "Why do we enjoy mistakes?" and to propose that it is not the mistakes per se that people enjoy. It is the "emotional reward for discovering and thus undoing mistakes in thought. We don't enjoy making the mistakes, we enjoy weeding them out."

Hurley's thesis is that our mind continuously makes rule-of-thumb conjectures about what will be experienced next and about the intentions of others. The idea is that humor evolved from this constant process of

confirmation: people derive amusement from finding discrepancies between expectations and reality when the discrepancies are harmless, and this pleasure keeps us looking for such discrepancies. (To wit: “I was wondering why the Frisbee was getting bigger, and then it hit me.”) Moreover, laughter is a public sign of our ability to recognize discrepancies. It is a sign that elevates our social status and allows us to attract reproductive partners.

In other words, a joke is to the sense of humor what a cannoli (loaded with fat and sugar) is to the sense of taste. It is a “supernormal” stimulus that triggers a burst of sensual pleasure—in this case, as a result of spotting mistakes. And because grasping the incongruities requires a store of knowledge and beliefs, shared laughter signals a commonality of worldviews, preferences and convictions, which reinforces social ties and the sense of belonging to the same group. As Hurly told psychologist Jarrett in 2013, the theory goes beyond predicting what makes people laugh. It also explains humor’s cognitive value and role in survival.

And yet, as Greengross noted in a review of *Inside Jokes*, even this theory is incomplete. It answers some questions, but it leaves others unresolved—for example, “Why does our appreciation of humor and enjoyment change depending on our mood or other situational conditions?”

Giovannantonio Forabosco, a psychologist and an editor at an Italian journal devoted to studies of humor (*Rivista Italiana di Studi sull’Umore*, or RISU), agrees: “We certainly haven’t heard the last word,” he says.

UNANSWERED QUESTIONS

Other questions remain. For instance, how can the sometimes opposite functions of humor, such as promoting social bonding and excluding others with derision, be reconciled? And when laughter enhances feelings of social connectedness, is that effect a fundamental function of the laughter or a mere by-product of some other primary role (much as eating with people has undeniable social value even though eating is primarily motivated by the need for nourishment)?

There is much evidence for a fundamental function. Robert Provine of the University of Maryland, Baltimore County, showed in *Current Directions in*

Psychological Science, for example, that individuals laugh 30 times more in the company of others than they do alone. In his research, he and his students surreptitiously observed spontaneous laughter as people went about their business in settings ranging from the student union to shopping malls.

Forabosco notes that there is also some confusion about the relation between humor and laughter: “Laughter is a more social phenomenon, and it occurs for reasons other than humor, including unpleasant ones. Moreover, humor does not always make us laugh.” He notes the cases where a person is denigrated or where an observation seems amusing but does not lead to laughter.

A further lingering area of debate concerns humor’s role in sexual attraction and thus reproductive success. In one view, knowing how to be funny is a sign of a healthy brain and of good genes, and consequently it attracts partners. Researchers have found that men are more likely to be funny and women are more likely to appreciate a good sense of humor, which is to say that men compete for attention and women do the choosing. But views, of course, differ on this point.

Even the validity of seeking a unified theory of humor is debated. “It is presumptuous to think about cracking the secret of humor with a unified theory,” Forabosco says. “We understand many aspects of it, and now the neurosciences are helping to clarify important issues. But as for its essence, it’s like saying, ‘Let’s define the essence of love.’ We can study it from many different angles; we can measure the effect of the sight of the beloved on a lover’s heart rate. But that doesn’t explain love. It’s the same with humor. In fact, I always refer to it by describing it, never by defining it.”

Still, certain commonalities are now accepted by almost all scholars who study humor. One, Forabosco notes, is a cognitive element: perception of incongruity. “That’s necessary but not sufficient,” he says, “because there are incongruities that aren’t funny.” So we have to see what other elements are involved. To my mind, for example, the incongruity needs to be relieved without being totally resolved; it must remain ambiguous, something strange that is never fully explained.”

Other cognitive and psychological elements can also provide some punch. These, Forabosco says, include features such as aggression, sexuality, sadism and cynicism. They don't have to be there, but the funniest jokes are those in which they are. Similarly, people tend to see the most humor in jokes that are "very intelligent and very wicked."

"What is humor? Maybe in 40 years we'll know," Forabosco says. And perhaps in 40 years we'll be able to explain why he laughs as he says it.

MORE TO EXPLORE

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